

# Marine and Coastal Avifauna of the South Atlantic Bight

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# Seabird Community Structure in the SAB

- Breeding seabirds in the SAB
  - Colonial nesters
  - Piscivores
  - Nearshore
- Wintering and wandering seabirds
- Northern breeders, tropical breeders, wanderers

















# Not Seabirds

(but maybe birds at/near sea)

- Shorebirds
  - Plovers, sandpipers, oystercatchers
- Wading birds
  - Herons, egrets
- Seaducks & assoc.
  - Eiders, scoters, loons



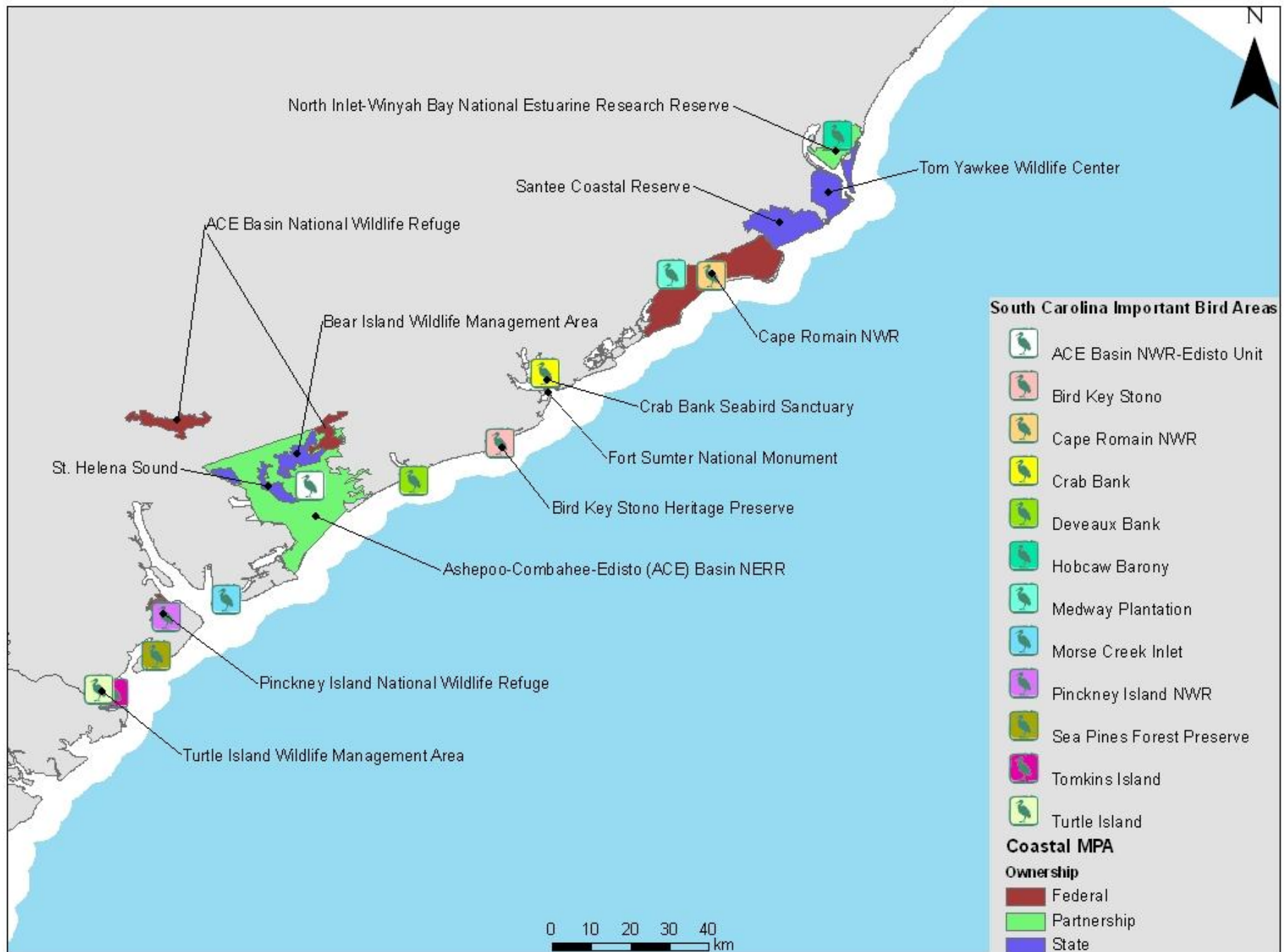
# Coastal Land Use

- Breeding sites or colonies
  - Nesting
  - Foraging
  - Loafing
  - Chick-rearing
- Loafing or roosting sites
- Migratory stopover sites
- Wintering sites

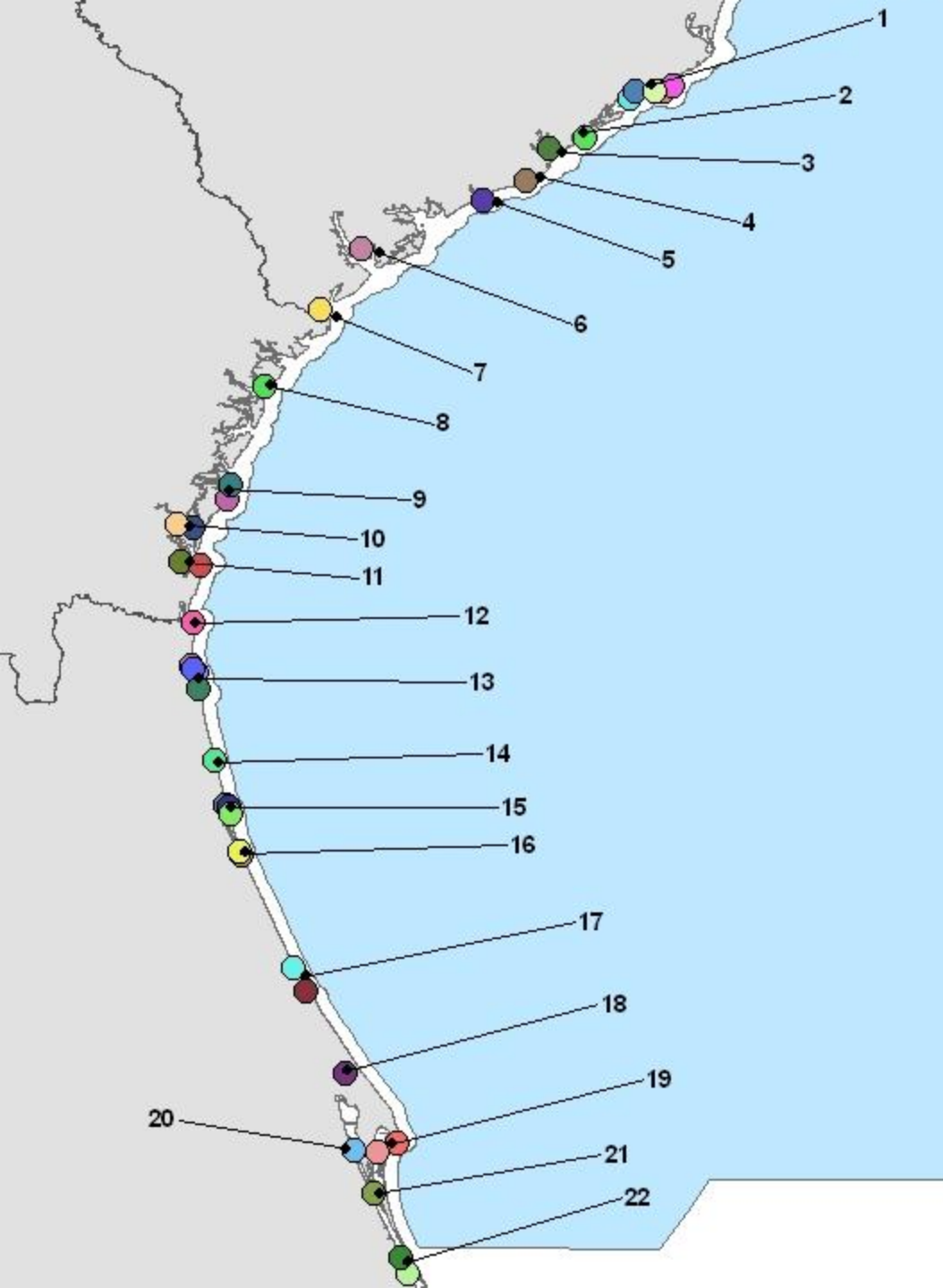


# Mechanisms Underlying Coastal Land Use

- Artifacts of history
  - Development, storms, dredging
  - Not a common research focus
- Opportunities for mitigation, recovery
  - Tomkins Island, Gulf of Mexico and BRPE
  - Often management driven
- Size, predator free, food availability, social attraction, metapopulation structure & competition
- Physical Oceanography – will it stay there?







## Major Colony Locations For SAB

### South Carolina Colonies

1

- Cape Island
- Lighthouse Island
- Raccoon Key/Sandy Point
- Marsh Island
- White Banks

2

- Skimmer Flats

3

- Crab Bank & Castle Pinckney

4

- Bird Key Stono

5

- Deveaux Bank

6

- Savannah Spoil Site

7

- Tomkins Island

### Georgia Colonies

8

- Ossabaw

9

- Little Egg Island Bar
- Little St Simons Island

10

- Brunswick Harbor Dredge Island
- Andrews Island

11

- Cumberland North Beach
- Satilla Marsh Island

### Florida Colonies

12

- Fort Clinch

13

- Amelia Island State Park
- Little Talbot Island
- Huguenot Memorial Park
- Bird Island
- Big Bird Island

14

- Guana Tolomato Matanzas NERP

15

- Anastasia State Park
- Anastasia State Recreation Area
- Porpoise Point

16

- Fort Matanzas National Monument
- Matanzas Island CMA
- Summer Haven

17

- Port Orange
- New Smyrna

18

- Haulover Canal

19

- Port Canaveral
- Canaveral Beach

20

- Barge Canal

21

- George-Brady/South

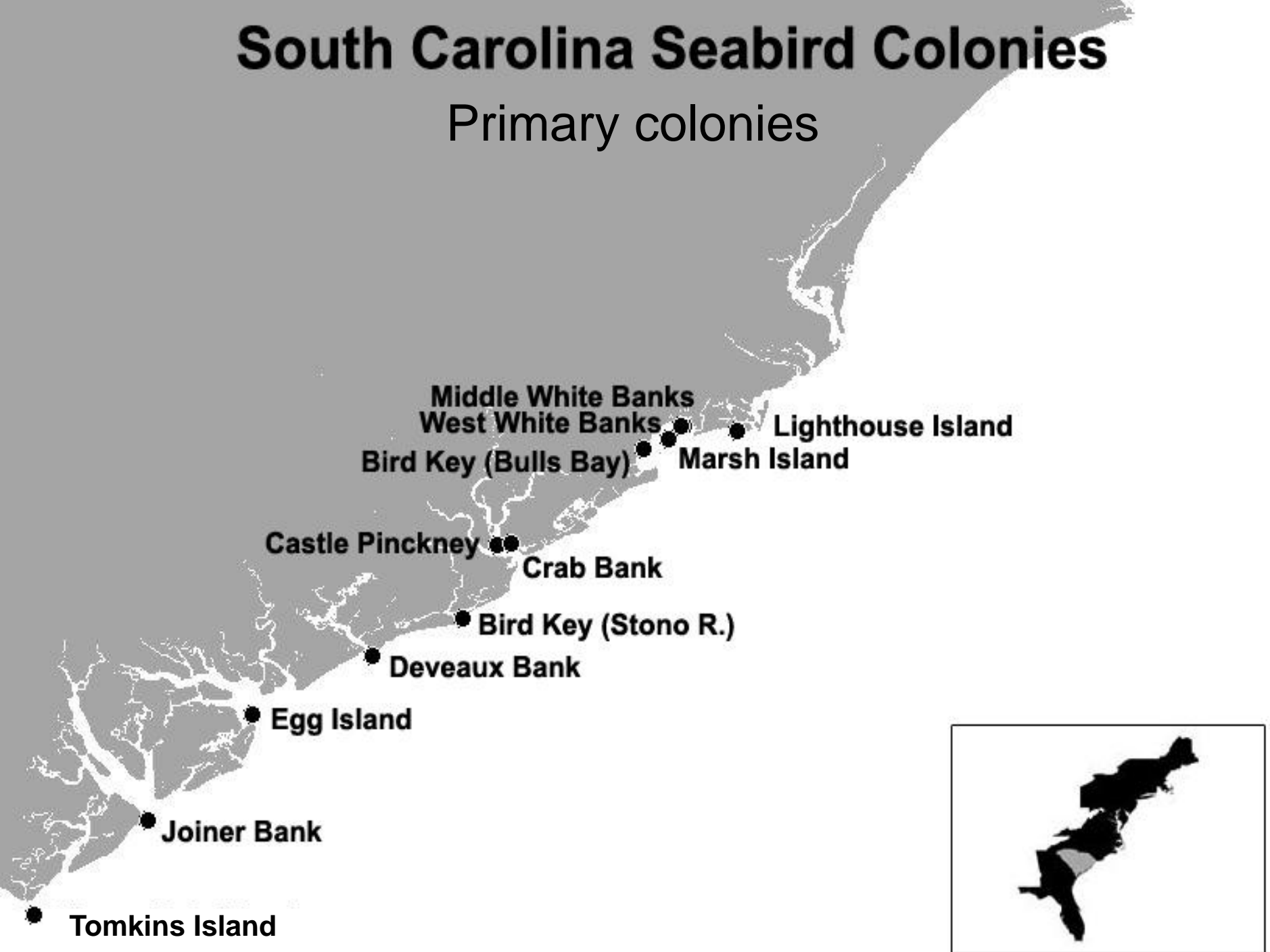
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- Valkeia
- Micco

■ SAB Study Area

# South Carolina Seabird Colonies

## Primary colonies

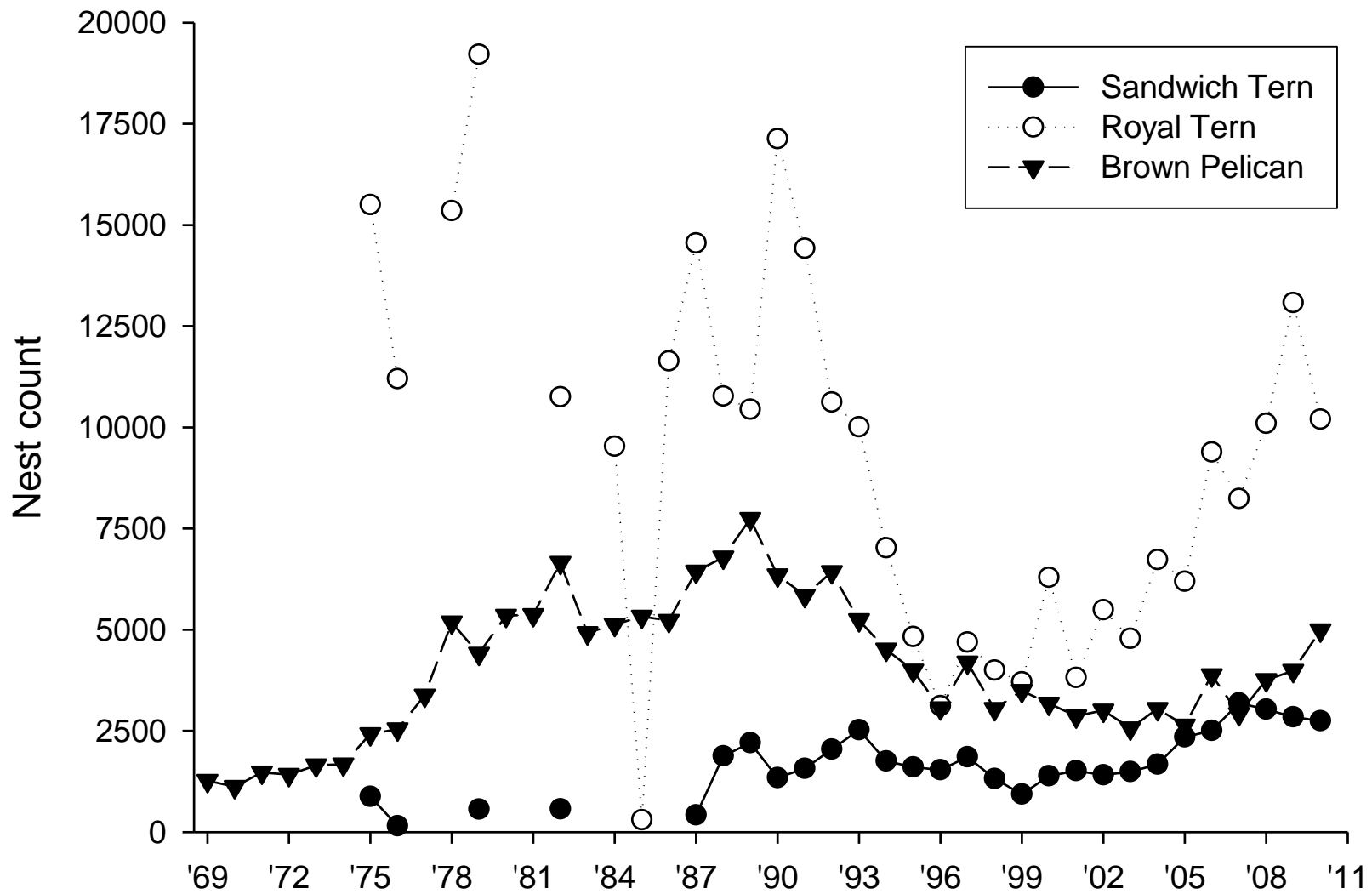




# Seabird Nest Counts by State in the South Atlantic Bight

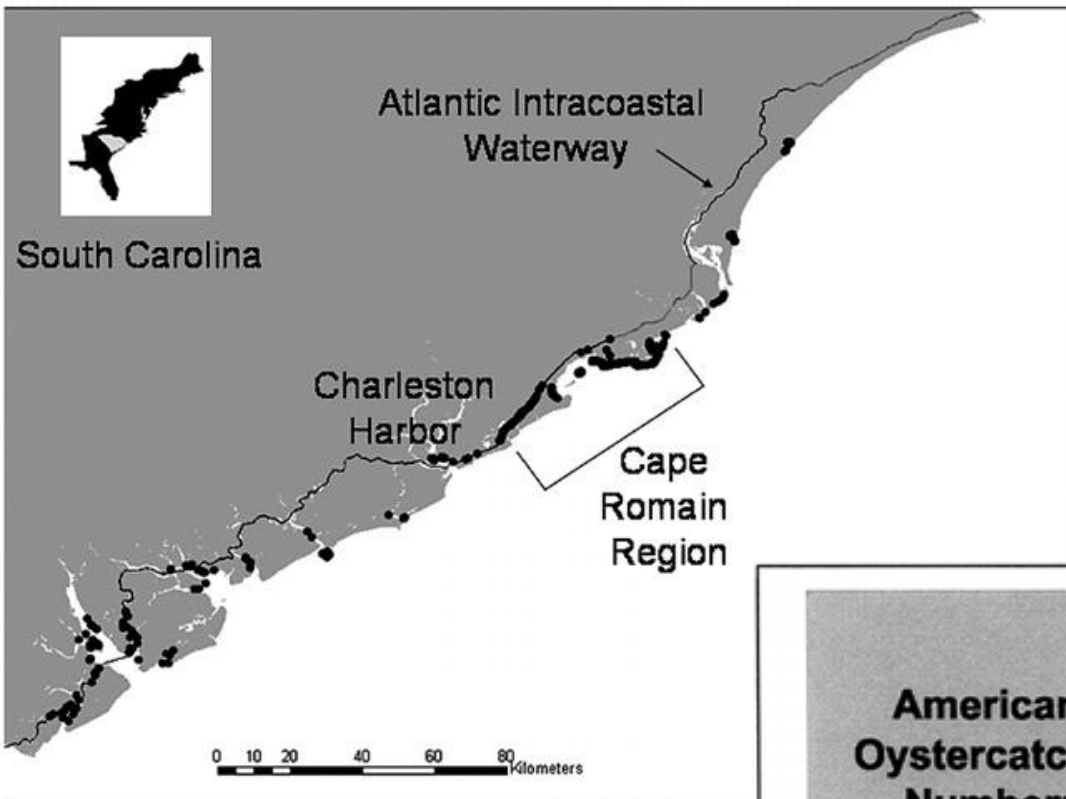
	SC	GA	NE FL
BRPE	5000	700	1300
ROYT	10,000	6500	100
SATE	2800	0	0
BLSK	1000	<300	<200

# Nesting Effort in SC

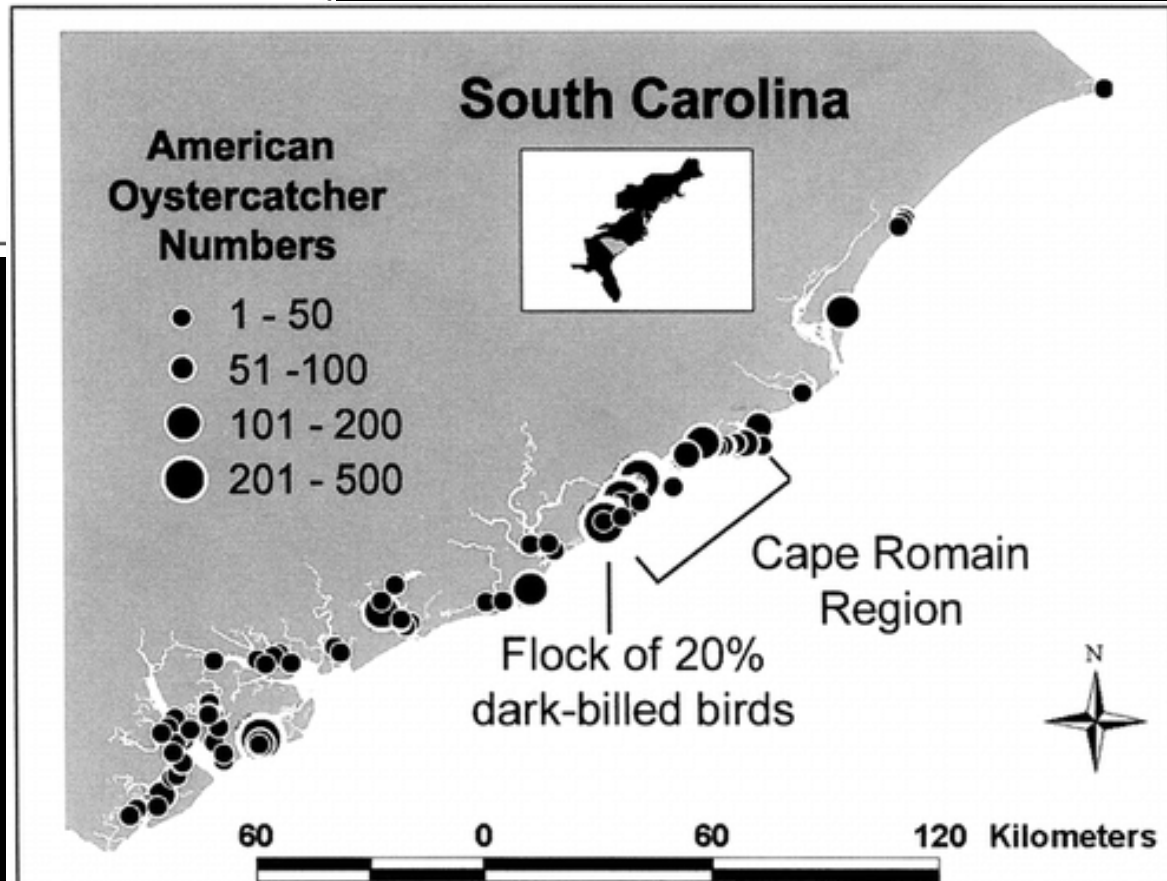




# Breeding locations American Oystercatchers



# Wintering locations American Oystercatchers



# Data Gaps

## Breeding Locations

- SAB colony register, current & historic
- Location, access, threats, managing agency, contact, bibliography of studies conducted, management actions, closure status
- Wintering & wandering seabirds requires knowledge of colonies of origin

# Diet v. Foraging

- Diet
  - Taxonomic composition, size class, energy density, proximate composition
- Foraging
  - Location, behavior, trip length, strategy, residence time, frequency
- Breeding v. Wintering v. Wandering



# Underlying Mechanisms

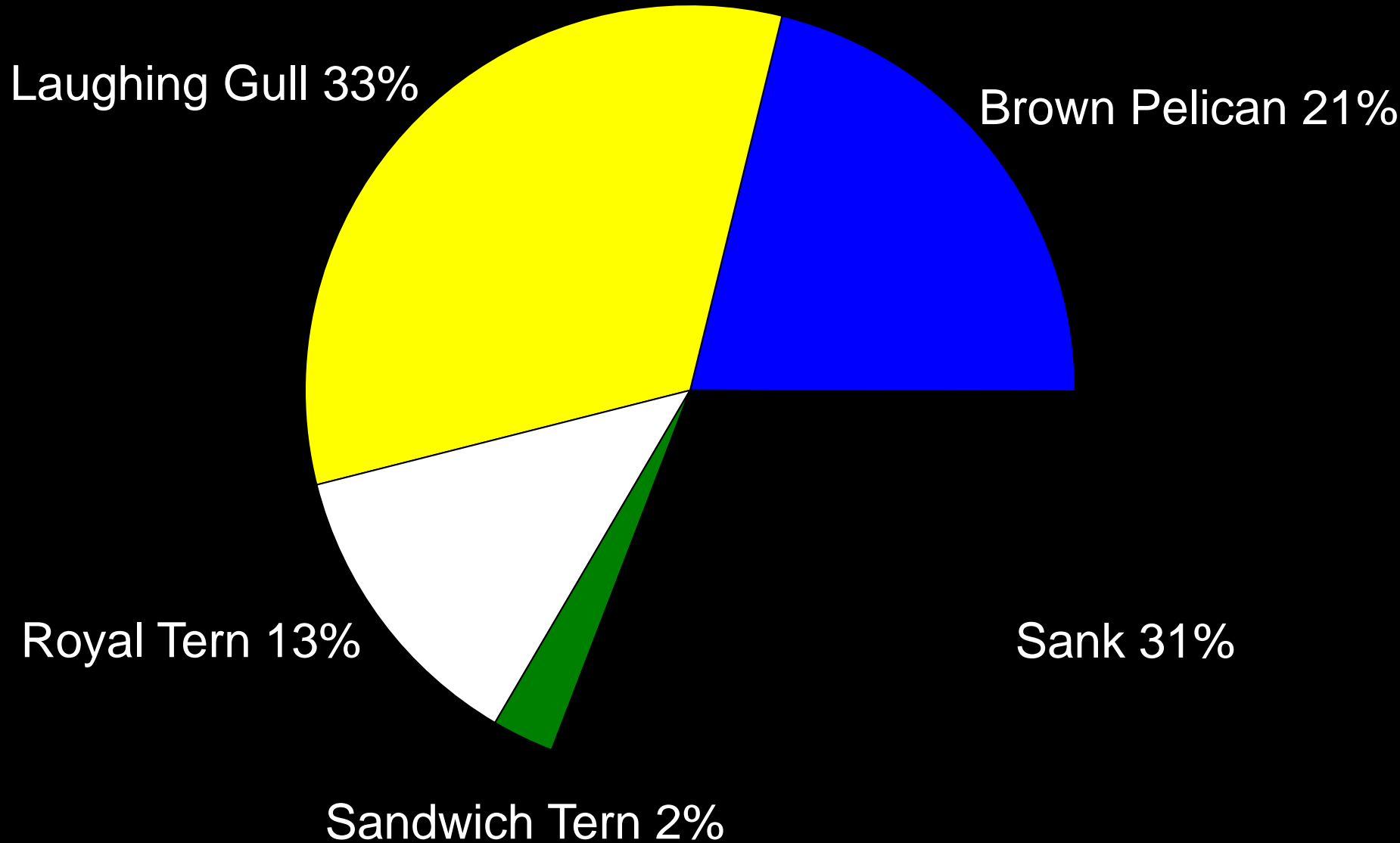
## Diet

- Food availability
  - Stock assessments, FOFI collections, diet samples
    - These in turn are affected by...
- Commercial Fisheries
  - Competition with fisheries
  - Supplemental food from fisheries
- Energetics

# Underlying Mechanisms Foraging

- Tidal stages, winds, physical oceanography, SST, Chl a
  - Nearshore v. pelagic
- Distance to food source
- Demand
- Energetics

1,705 Items Discarded





# Data Gaps

## Diet & Foraging

- Nearshore Diet
  - Colony-based diet studies in SAB
  - Multiple years
  - Diet database
- Nearshore Foraging
  - Tracking studies of primary species (BRPE, ROYT, BLSK)
  - Breeding and nonbreeding seasons
  - Interactions with fisheries (see below)

# Data Gaps

## Diet & Foraging

- Wintering and wandering seabirds
  - Isotope studies
  - At-sea survey data (nearshore, offshore)
  - Tracking studies

# Habitat Use and Distribution At Sea

- Nearshore species – foraging activity
- Pelagic species – foraging activity, loafing/roosting activity
  - Flying or diving or sitting
- Interpreting ‘use’ differs based on the species/guild
- Stage of the annual cycle matters
- Multiple spatial dimensions



# Nearshore Seabirds: Habitat Use/Distribution at sea

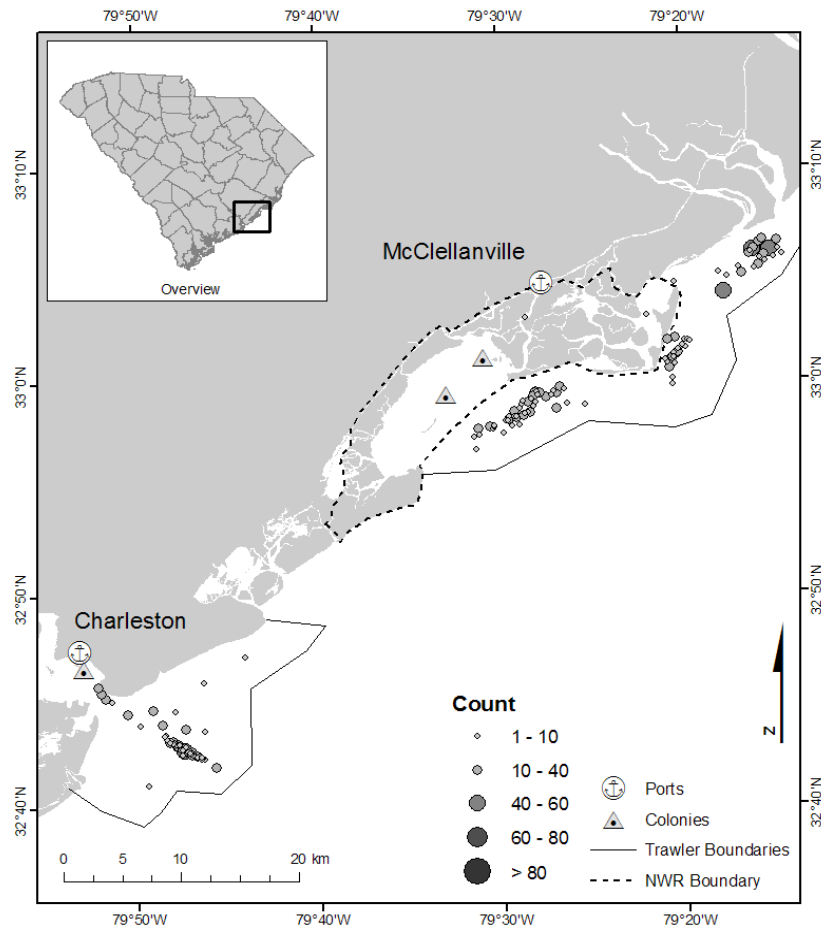
- Food availability
  - Commercial fishing activity
- Location of coastal land use
  - Central place foragers
- Ocean and atmospheric characteristics
  - Turbidity, tidal stage, wind strength
- Energetic demands
  - Thermoregulation, reproduction

# Nearshore Seabirds:

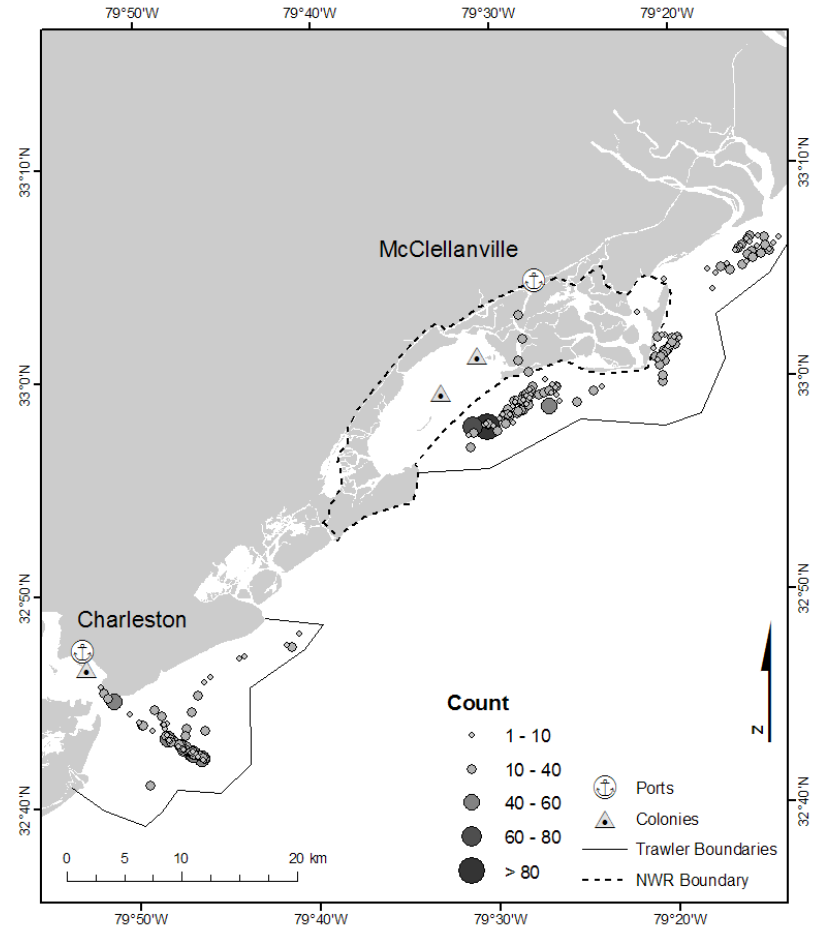
## Habitat Use/Distribution at sea

- Nearshore and estuarine commonly used based on observations but rarely studied directly
- Offshore movements documented/observed but not studied directly
- Migratory stop over sites known from observations, paths not studied directly

# Nearshore Habitat Use in SC: Pelicans and Terns



Brown Pelican



Royal Tern

# Pelagic Seabirds: Habitat Use/Distribution at sea

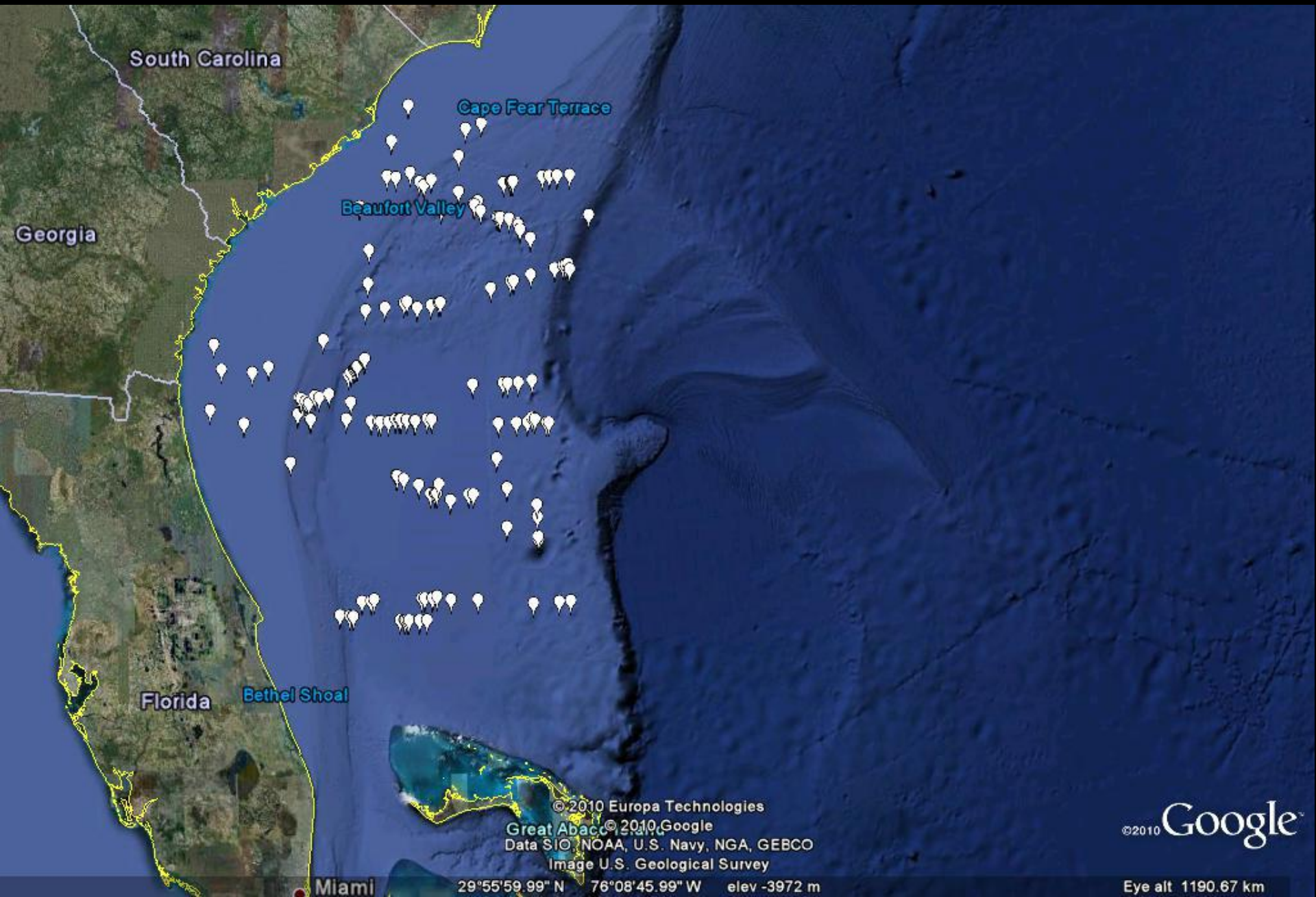
- Food availability
  - Commercial fishing activity
- Ocean and atmospheric characteristics
  - SST, Chl a, wind patterns, upwelling
- Distance to boundary currents important factor



# Pealgie Habitat Use/Distribution

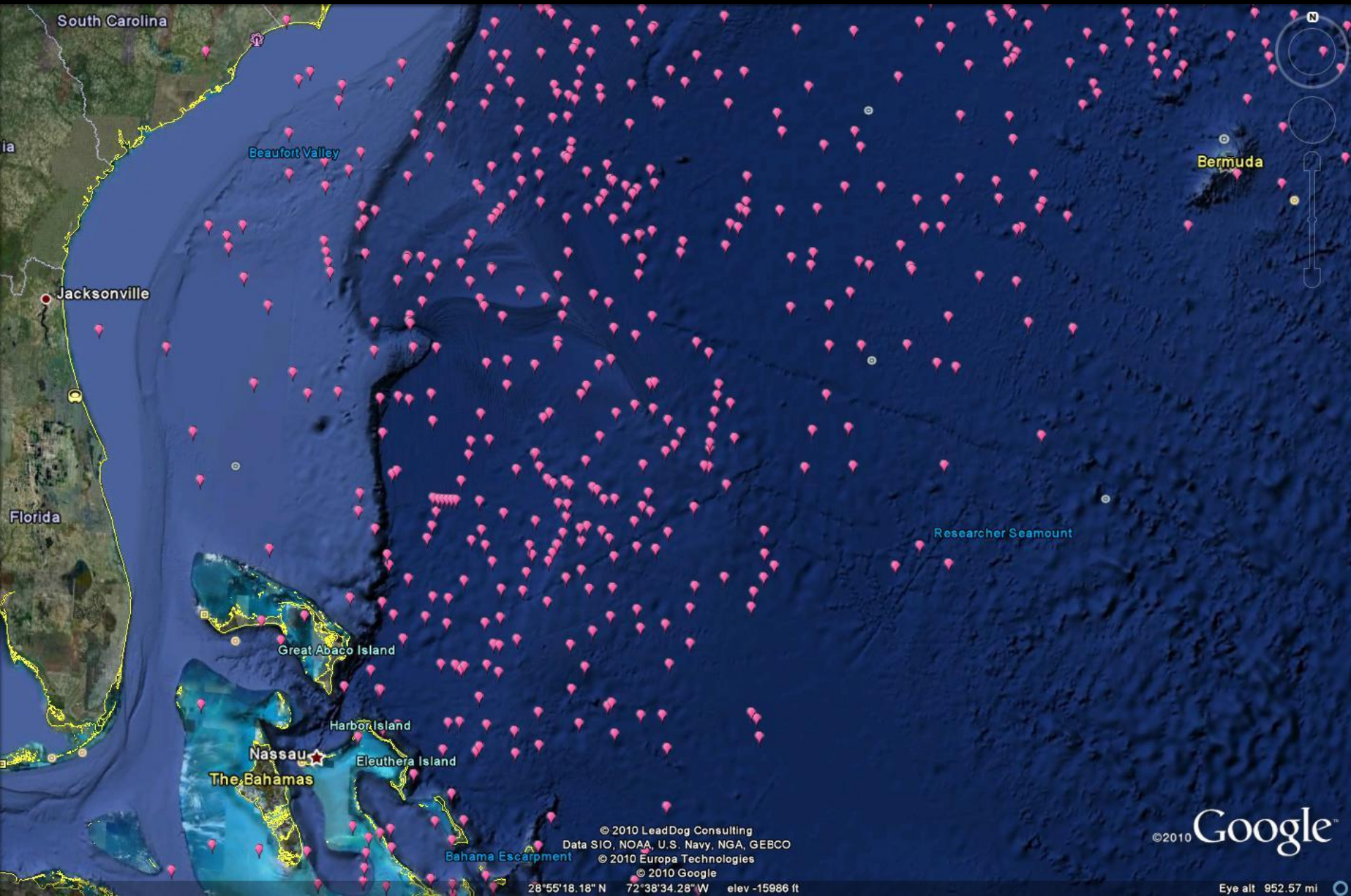
- Observational data
  - Far fewer platforms or opportunities compared to NC
- Some emerging tracking data
  - Gannets, shearwaters, tropicbirds
- Some emerging survey data
  - Sea duck surveys, vessel-based

# Audubon's Shearwater (vessel surveys)



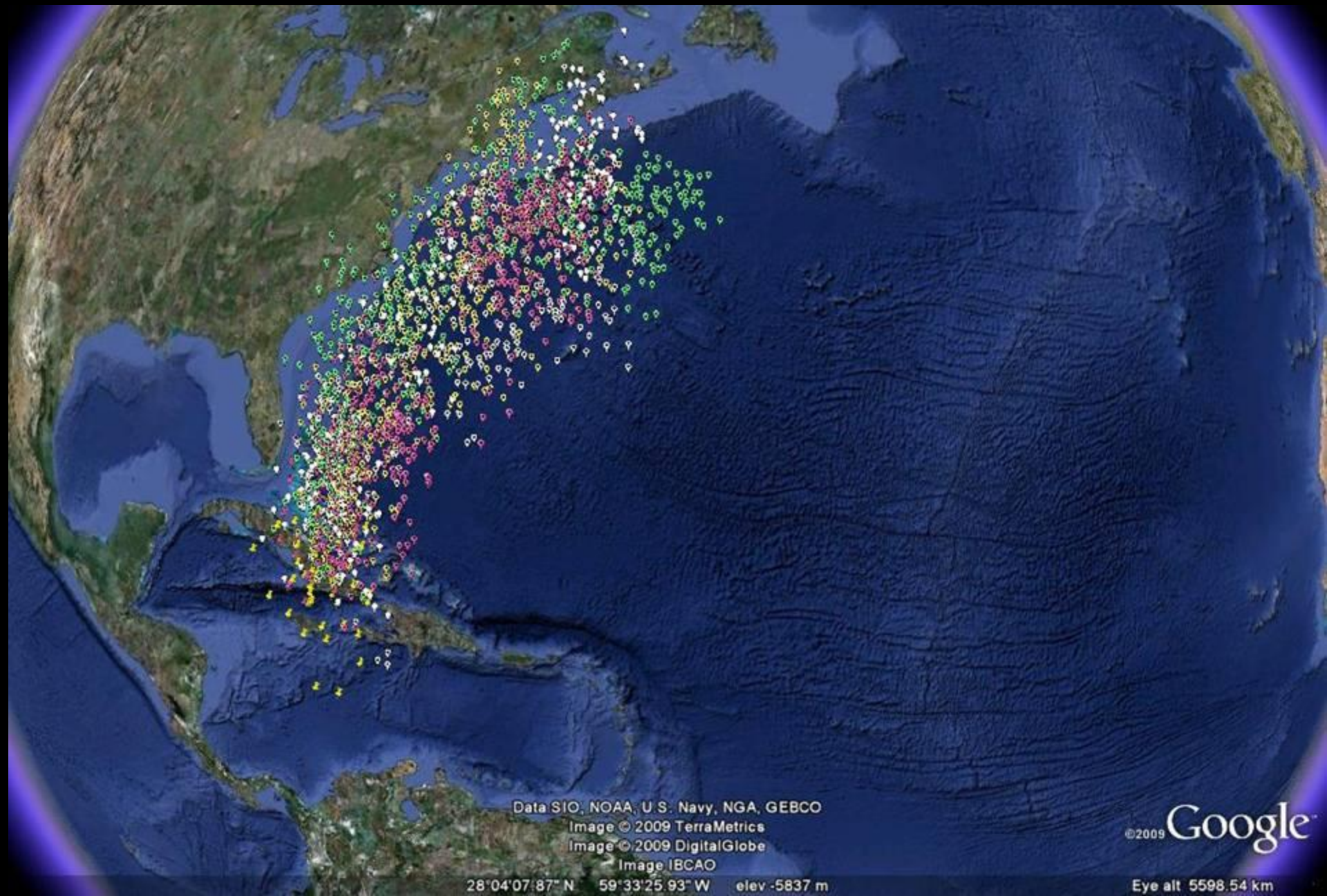


# Audubon's Shearwater (geolocator data)





# Audubon's Shearwater (geolocator data)





# Distribution/Habitat Use

- Nearshore & pelagic
  - tracking, surveys
- At sea distribution in relation to habitat features (nearshore and offshore)
- At sea distribution in relation to commercial fisheries activities (nearshore and offshore, food and risk)

# Distribution by Zone in SAB

	Estuarine	Coast/Beach	Nearshore	Pelagic
Seabirds	B-F-M-W	B, W	F-M-W	F-M-W
Seaducks	F-M-W	W	F-M-W	f-m-w
Shorebirds	b-F-M-W	b-F-M-W	M	----
Waders	B-F-M-W	B-F-M-W	M?	----

# State of Knowledge

## General/SAB

	<b>Breeding sites</b>	<b>Foraging &amp; Diet</b>	<b>Habitat Use – Distrib at sea</b>	<b>Status &amp; Trends</b>
Nearshore seabirds	VG/VG	VG/Fair	Good/Fair	Good/Fair
Pelagic seabirds	VG/--	Good/Poor	Good/Fair	Fair/--

# Seabirds and Spatial Scale

- Extensive spatial distribution during all phases of the annual cycle
- Transboundary on short and long time scales
- Terrestrial and marine factors also operating at multiple scales



# Effects of Events on Seabirds

- Proximate v. Ultimate
- Apparent v. Underlying Mechanisms
- Spatial Scale
- LH characteristics can differ among locations
- Proximity does not equal similarity

